

## **ARICIDEA (ALLIA) BRYANI, A NEW SPECIES OF POLYCHAETE (POLYCHAETA: PARAONIDAE) FROM THE NORTHERN GULF OF MEXICO**

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**ABSTRACT** *Aricidea bryani*, a new species of polychaete (Polychaeta: Paraonidae) belonging to the subgenus *Allia* Strelzov 1973, is described from shallow subtidal sediments along the northern shore of Mississippi Sound, an estuary of the northern Gulf of Mexico. The new species is distinguished from other members of the subgenus by the presence of tuberculate neuropodial lobes in the anterior 15-20 setigers, a cirriform median antenna that extends posteriorly to setiger three, and by modified neuropodial setae that are abruptly tapered at mid-length, but lack terminal aristae.

### **INTRODUCTION**

Specimens of an undescribed species of *Aricidea* Webster 1879 (subgenus *Allia* Strelzov 1973) were collected near the historic Biloxi Lighthouse (Harrison County, Mississippi) during January 1991 to April 1992. The collection site (type locality) was a shallow, subtidal, mesohaline habitat in water less than 2 m deep. Collections were made adjacent to a fishing pier that extended seaward from an artificial, public beach on the northern shore of Mississippi Sound, an estuary of the northern Gulf of Mexico.

*Aricidea* Webster, 1879, is one of six genera in the family Paraonidae Cerruti, 1909; the others are *Paraonis*, *Paraonides*, *Cirrophorous*, *Levinsonia*, and *Sabidius*. Based on the presence and characteristics of modified neurosetae, Strelzov (1973) proposed subdividing the genus *Aricidea* into four subgenera as follows: *Aricidea* s. str.; *Aedicira* Hartman, 1957; and two new subgenera, *Allia* and *Acesta*. Fauchald (1977) elevated Strelzov's four subgenera to generic rank without giving specific reasons, and Hartley (1981) corrected the subgenus name of *Acesta* to *Acmira*, since the former was preoccupied in the phylum Mollusca. The taxonomic scheme used here follows Strelzov (1973) and Hartley (1981).

Holotypes, paratypes, and additional material from the type locality are deposited in the U.S. National Museum of Natural History, Smithsonian Institution (USNM), Washington, DC. Other specimens are deposited in the museum of the Gulf Coast Research Laboratory (GCRL), Ocean Springs, Mississippi, and in the personal collections of the authors.

### **TAXONOMY**

**Family Paraonidae Cerruti, 1909**

**Genus *Aricidea* Webster, 1879**

**Subgenus *Allia* Strelzov, 1973**

***Aricidea (Allia) bryani*, new species**

**Figures 1-4**

**Synonym:** *Aricidea* cf. *alisdairi* (Gaston 1984, in part).

### **MATERIAL EXAMINED**

**Type material.** Northern Gulf of Mexico, Biloxi, Mississippi (30°10'N, 88°53'50"W). Holotype 22 mm length, 1.0 mm width (USNM 172124), 4 paratypes (USNM 172125), June 30, 1991; 26 paratypes from two collections made on March 28, 1991 (USNM 172126) and April 2, 1992 (USNM 172127), shallow subtidal (0.5-1.0 m), sediment type: well-sorted fine sand; all type material collected by K. Matulewski.

**Additional material.** Apalachee Bay, FL (30°15'N, 84°16.2'W): 5 specimens collected during July 1991, 4.6 m depth, muddy sand (83% sand); Oyster Bay, FL (30°3.0'N, 84°17.2'W): 4 specimens collected during July 1991, 2.1 m depth, sandy mud (57% silt-clay); Mississippi Sound, MS (30°15.3'N, 88°26.1'W): 1 specimen collected during July 1991, 4.9 m depth, sandy mud (90% silt-clay); Chandeleur Sound, LA (29°58.2'N, 88°51.1'W): 5 specimens collected during July 1991, 2.4 m depth, muddy sediments (96% silt-clay); Terrebonne Bay, LA (29°45.0'N, 90°15.0'W): 5 specimens collected during July 1991, 2.3 m depth, muddy sediments (95% silt-clay); Caracahua Bay, TX

(28°37.6'N, 96°22.5'W): 1 specimen collected during July 1991, 1.2 m depth, sandy mud (73% silt-clay); Off St. Petersburg, FL (27°57'00.4"N, 83°09'00.3"W) (USNM 090223): 1 specimen collected during July 1976, 19 m depth, fine-very fine sand; Off St. Petersburg, FL (27°56'00.5"N, 83°27'29.6"W) (USNM 090216): 1 specimen collected during August 1977, 30 m depth, clayey, sandy silt; Off St. Petersburg, FL (27°52'30.5"N, 83°33'59.0"W) (USNM 090217): 1 specimen collected during August 1977, 34 m depth, clayey, sandy silt; Off St. Petersburg, FL (27°57'28.8"N, 83°42'29.2"W) (USNM 090218): 1 specimen collected during July 1976, 37 m depth, silty-very fine sand; Off Apalachicola, FL (29°30'N, 84°27'W) (USNM 090219): 1 specimen collected during July 1976, 24 m depth, medium-fine sand.

### DESCRIPTION

Based on holotype and paratype material. Body dorsoventrally flattened in branchial region, more cylindrical in postbranchial region. Prostomium triangular, bluntly pointed anteriorly (Figure 1A). Nuchal slits very slender, inconspicuous, directed anterolaterally. Median antenna cirriform, widest near base, extending to anterior edge of setiger 3 (Figure 1B). Two small eyes present, faint in preserved specimens. Branchiae beginning on setiger 4, numbering 25-33 pairs on large specimens, 14-18 on very small specimens. Branchiae broad basally, tapering to slender, bluntly pointed terminus; overlapping across dorsum and perpendicular to body axis (Figures 1, 2). Branchiae subequal, except those of last pair, which are similar in shape and smaller, about 2/3 length of others (Figures 2D, 4A). Ciliated bands occurring across dorsum between pairs of branchiae and on branchiae, but less developed in the last pair (Figure 4A). Notopodial postsetal lobes digitate on setigers 1 and 2 (slightly longer on setiger 2), twice as long on setiger 3 and thereafter, thinner in postbranchial region to pygidium (Figures 2, 3). Neuropodial postsetal lobes tuberculate from setiger 1 to about setiger 18, absent on setiger 20 and thereafter (Figures 1, 2, 3). Notosetae all thin and capillary, numbering about 22-25 per fascicle in prebranchial and branchial region and about 8-13 per fascicle in postbranchial region. Neurosetae number about 22-28 per fascicle in prebranchial and branchial region and about 35 per fascicle in postbranchial region, stouter and somewhat shorter than notosetae in prebranchial region and anterior two-thirds of branchial region (Figures 1, 2); becoming thin, similar to notosetae in posterior third of branchial region and posteriorly to about setiger 60 at which point fascicles include setae abruptly tapering at about midlength with pubescent fringe on setal shaft where abrupt tapering occurs (Figure 3C);

pubescent fringe extending from midlength to terminus of shaft, forming sharp tip (Figure 4B); abruptly tapering neurosetae becoming more numerous in far-posterior setigers (Figure 3B), comprising most of setae in fascicles near the pygidium. Body narrowing at pygidium to half its postbranchial width. Pygidium with two ventrolateral and one ventromedial anal cirri; ventromedial cirrus about half the length of two lateral cirri (Figure 1C).

**Variation.** The median antenna generally is cirriform, but antennae of some paratypes have a greater swelling near the base than that of the holotype. Additionally, some small (young) specimens have short, tuberculate antennae that appear to be in a developmental stage. Specimens from offshore Florida have similar numbers of branchiae, similar notopodial and neuropodial lobes, similar neurosetae and notosetae, but shorter antennae than on other specimens of *A. bryani* (to setiger 1 in USNM 090216, 090217, 090218, 090223; to middle of setiger 2 in USNM 090219).

**Remarks.** *Aricidea bryani*, n. sp., belongs to the subgenus *Allia*, which currently has 17 species characterized by the presence of neurosetae that are markedly thicker than corresponding notosetae. These characteristic neurosetae have abruptly tapering shafts, with more abrupt tapering in far posterior segments. *Aricidea* (*Aricidea*) *fragilis*, which is the type species for the genus, has similar neurosetae to species of *Aricidea* (*Allia*), but is distinguished by the presence of pseudocompound (pseudoarticulate) neurosetae in some posterior segments (see Hartman 1957: 317). Although we were not able to examine type specimens, our examination of *A. fragilis* specimens from offshore North Carolina (USNM 51181), from Pivers Island near Beaufort, North Carolina, and from Perdido Key, Florida, revealed that all had the characteristic pseudocompound neurosetae in posterior segments. We are inclined, therefore, to maintain the subgenus *Allia* based on its modified setal type as set forth by Strelzov (1973). *Aricidea* (*Aricidea*) *fragilis* is otherwise distinguished from *A. bryani* by the presence of short (not tuberculate) neuropodial lobes to setiger 40 (not to 20), and by its short, subulate median antenna, which extends at most to setiger 2 (Webster 1879, Pettibone 1965:129).

Comparative characteristics of the species of *Aricidea* (*Allia*) are summarized in Table 1. Four species of *Allia*, like *A. bryani*, have neuropodial lobes and a cirriform antenna that extends posteriorly to at least setiger 3, but differ from the new species in the following respects: *A. abbranchiata* lacks branchiae; *A. quadrilobata* has a long, filamentous antenna extending to setiger 9, well-formed, digitate neuropodial lobes anteriorly, and biramous notopodial cirri in the branchial region of larger specimens; *A. suecica* (= *A. nolani*; Strelzov 1973) has modified setae with terminal aristae on posterior segments; *A. pseudanne*

TABLE 1

Species of *Aricidea*, subgenus *Allia* with some comparative morphological characteristics for specimens of maximum size. Includes data from Hasan (1960), Pettibone (1963), Hartman (1965), Day (1967), Imajima (1973), Strelzov (1973), Katzmann and Laubier (1975), Hartley (1984), and Gaston (1984).

Species	Neuropodial lobes		Antenna		Pairs of branchiae
	type	end at setiger	type	end at setiger	
<i>A. marianne</i> Katzman & Laubier, 1975	tuberculate	13	short, ovoid, digitate tip	0	12-19
<i>A. bulbosa</i> Hartley, 1984	tuberculate	15	short, fusiform	0	21
<i>A. albatrossae</i> Pettibone, 1957	tuberculate	12-25	short, subulate	0	26-30
<i>A. hartmani</i> (Strelzov, 1968)	tuberculate	12	short, conical-clavate w/cerataphore	0-2	15-19
<i>A. ramosa</i> Annenkova, 1934	tuberculate	17	short, branched	1*	13-17
<i>A. roberti</i> Hartley, 1984	tuberculate	17	short, cylindrical	1	22-26
<i>A. claudiae</i> Laubier, 1967	tuberculate	9	basally enlarged, sharply attenuated tip	1	16
<i>A. curviseta</i> Day, 1963	tuberculate	20	cirriform	1	44
<i>A. bryani</i> n. sp.	tuberculate	18-20	cirriform	3	25-33
<i>A. abranchiata</i> Hartman, 1965	tuberculate	2-4	cirriform	4-7	0
<i>A. suecica</i> Eliason, 1920	tuberculate	25	cirriform	5	30
<i>A. pseudanne</i> Katzmann & Laubier, 1975	tuberculate	5-6	cirriform	5-6*	13
<i>A. quadrilobata</i> Webster & Benedict, 1887	conical, fusiform	25	cirriform, slender	9	27
<i>A. monicae</i> Laubier, 1967	absent	—	cirriform	0	9
<i>A. facilis</i> Strelzov, 1973	absent	—	short, club-shaped	0	9-15
<i>A. pulchra</i> Strelzov, 1973	absent	—	cirriform	1	18
<i>A. alisdairi</i> Hasan, 1960	absent	—	cirriform	2	43
<i>A. trilobata</i> Imajima, 1973	absent	—	long, clavate	2	20

\* Based on illustration

is smaller, has an antenna extending to setigers 5-6, only 6-13 pairs of branchiae, and has neuropodial lobes only on the first six setigers. Two other species are similar to *A. bryani*, but are distinguished as follows: *A. roberti* has a short, cylindrical antenna, fusiform notopodial postsetal lobes on first two setigers (longer than those of *A. bryani*), and neuropodial lobes to setiger 17; *A. bulbosa* has bulbous posterior branchiae.

The new species was originally described as *Aricidea* (*Allia*) cf. *alisdairi* by Gaston (1984), but not all of Gaston's specimens were determined to be *A. bryani*. Some specimens had similar notosetae and neurosetae to *A. bryani*, but longer notopodial lobes in the first two setigers and either shorter antennae (USNM 090220, 090222) or longer antenna (USNM 090221) than *A. bryani*. Another specimen (USNM 090215) had a short, clavate antenna (to setiger 1) and pseudoarticulate neurosetae in the posterior region.

**Ecology.** *Aricidea* (*Allia*) *bryani* was abundant in the littoral zone of Mississippi Sound. Specimens at the type locality occurred in densities of 28-555/m<sup>2</sup> during January 1991 to April 1992 (Matulewski 1995). Sediments of the area consisted primarily of well-sorted fine sand that periodically contained considerable amounts of silt and detritus. Most preserved specimens of the new species had a distinct corkscrew shape, and juveniles almost always were green, possibly due to ingested algae. Adults were whitish with an orange-brown stripe dorsally in some specimens. Presence of small specimens in the monthly collections at the type locality led the authors to conclude that larval settlement occurred from January to March during 1991. Only large specimens (adults) were collected during the summer. Specimens from the type locality were usually filled with ingested sand grains that were packed in the far-posterior gut. A combination of the filled gut and the

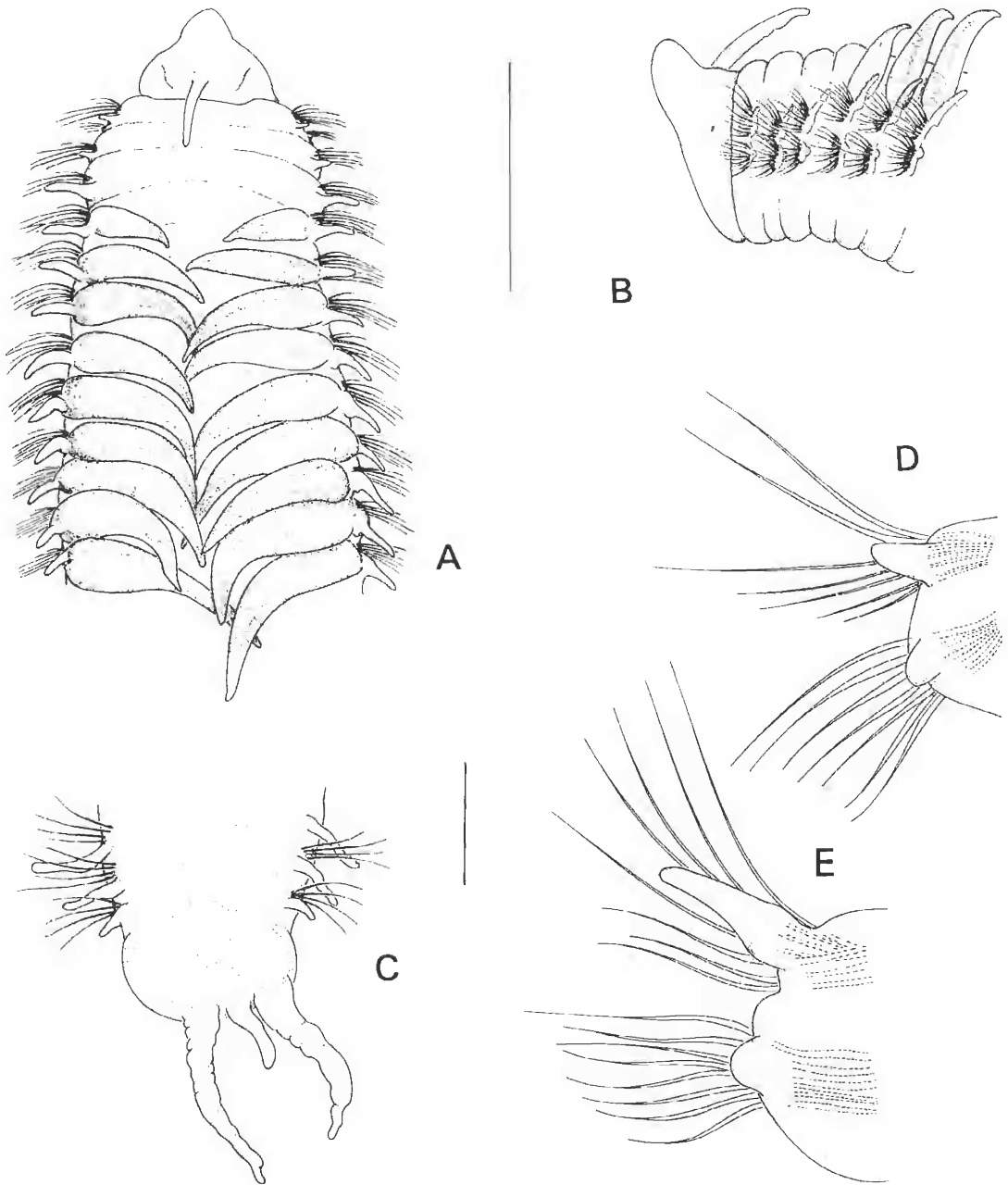


Figure 1. *Aricidea (Allia) bryani*, new species. A. Anterior end, dorsal view. B. Anterior end, lateral view. C. Pygidium (holotype), dorsal view. D. Setiger 1. E. Setiger 3. Parapodium in posterior view, number of setae reduced for clarity. Scales: A, B = 0.5mm; C, D, E = 0.1mm.

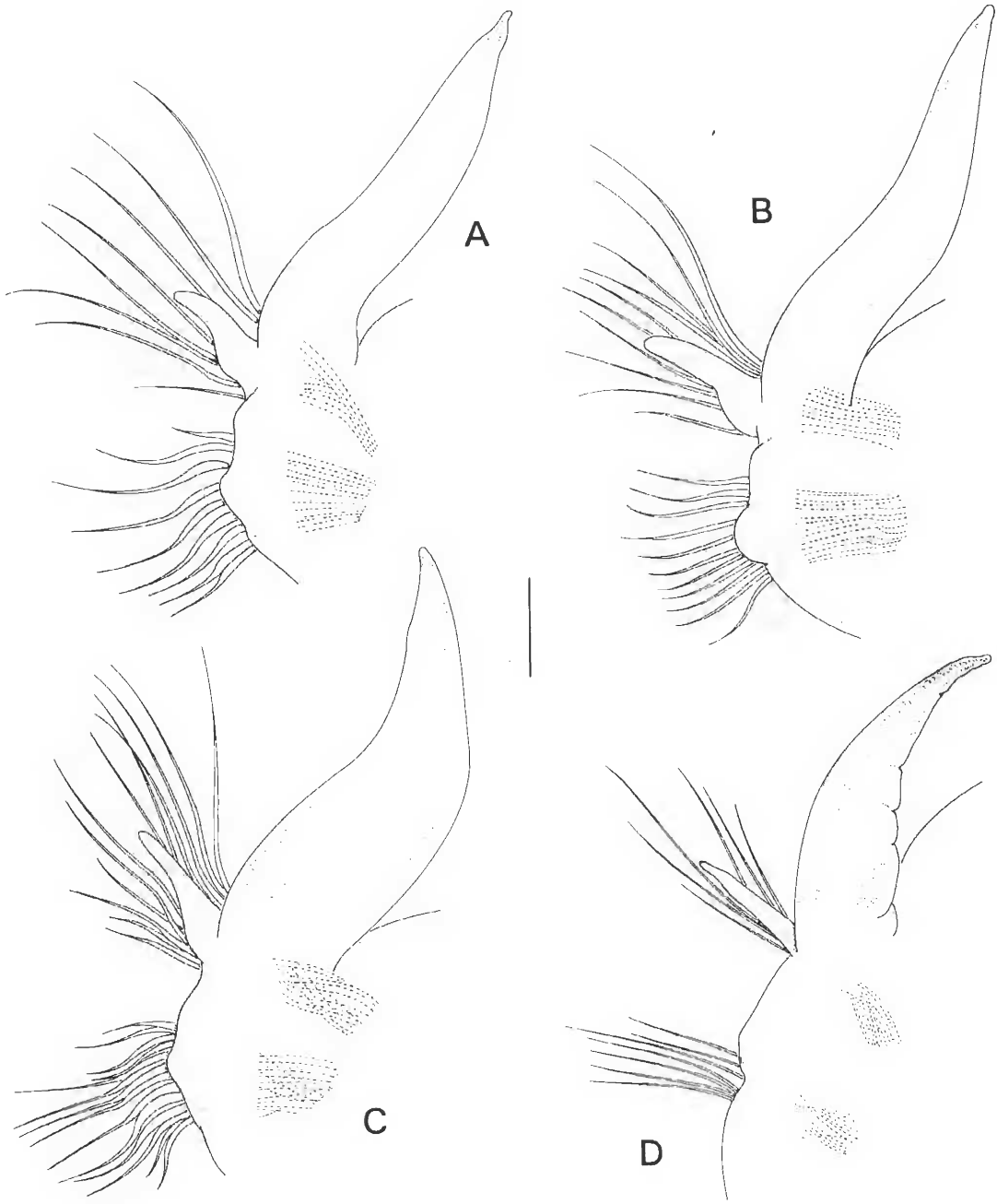


Figure 2. *Aricidea (Allia) bryani*, new species. Representative branchial parapodia, posterior views, number of setae reduced for clarity. A. Setiger 6. B. Setiger 9. C. Setiger 16. D. Setiger 29. Scale = 0.1mm.

thin body wall resulted in loss of the far-posterior region and pygidium of most specimens during sample preparation. *Aricidea (Allia) bryani* was one of over 40 species of polychaetes that inhabited the type locality.

Ciliated bands across the dorsum and on the branchiae (Figure 4A) probably function in motility, enhance oxygen

uptake, and may help keep the body surface free of debris. Similar bands were evident in scanning electron micrographs of *Aricidea roberti* and *Aricidea suecica* (Hartley 1984).

**Etymology.** The species is named in honor of Bryan Deaver Gaston, son of the senior author.

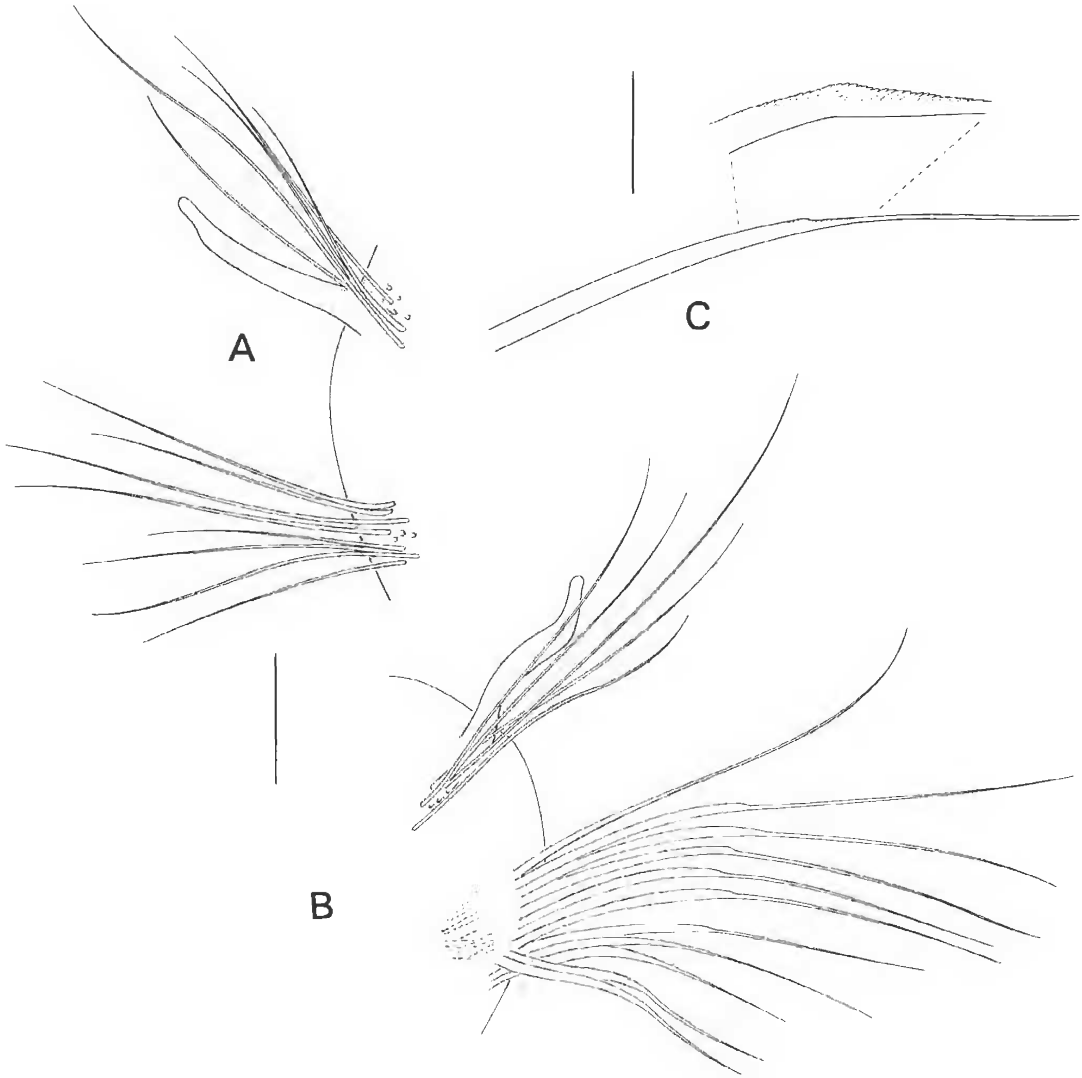


Figure 3. *Aricidea (Allia) bryani*, new species. Representative postbranchial parapodia, anterior views, number of setae reduced for clarity. A. Setiger 37. B. Setiger 118. C. Detail of neuroseta from setiger 118. Scales: A, B = 0.1mm; C = 0.05mm.

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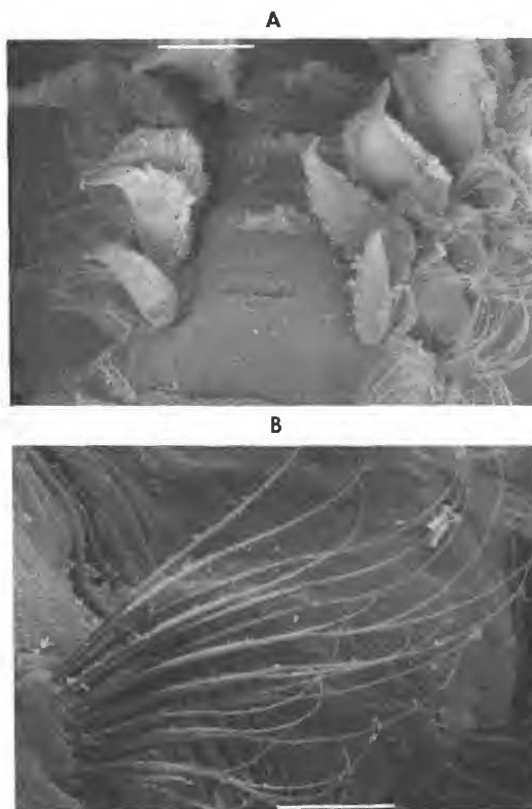


Figure 4. *Aricidea (Allia) bryani*, new species. Scanning electron micrographs. A. Posterior branchial region, dorsal view. B. Neuropodial fascicle from posterior region, anterior view (setiger 130). Scales: A = 0.1mm; B = 0.05mm.